

INTEGRATING THE INDIANA WORKFORCE INTO THE WIND INDUSTRY

WINDIANA 2010 CONFERENCE

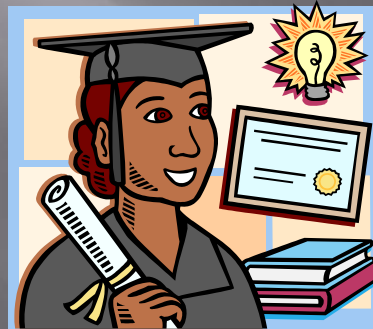
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Integration

Workforce



Education



Wind Industry



Education is needed

- ▣ “Energy Economy” is predicted to be dominant in next few decades.
- ▣ Significant federal funding has been and will be devoted to renewable energy research and technology development.
- ▣ Commercialization is the goal, meaning the energy sector will grow.
- ▣ The needs of engineers with training in energy engineering will be in demand.

IUPUI

- ▣ Establishment of Richard G. Lugar Center of Renewable Energy (LCRE) in 2007
- ▣ Research focuses on energy storage, fuel cell and battery technologies, power system grid control, wind energy, etc.
- ▣ Development of faculty expertise in the fields
- ▣ Development of energy degree programs and training programs

Accomplishments

- ▣ Secured more than \$8M research funding from government agencies
- ▣ Participated in the Indiana Advanced Electric Vehicle Training and Education Consortium for course developments
- ▣ Established a new Energy Engineering BS degree program
- ▣ Organized workshops, seminars, etc. for state wide audiences

Uniqueness

- ▣ Our BS program in energy engineering is research-based. The curriculum covers broad topics.
- ▣ IUPUI has the research infrastructure (LCRE). It creates the depth and provides frontier knowledge to students.
- ▣ Both ME and ECE programs offer fundamental engineering courses required for energy engineering.
- ▣ Specialty courses in energy engineering will be offered.
- ▣ The curriculum will provide a bridge for students to energy related graduate programs.
- ▣ There are many energy related companies in Indiana, which provide internship and co-op opportunities as well as guidance to the new degree program.

Education

- ▣ BS degree in Energy Engineering (4 years)
- ▣ Combined BS degree in Energy Engineering and Mechanical Engineering
- ▣ Internship opportunities with energy related companies, such as Earth Solar, AlgaeWheel, Xylanco, Horizon Wind Energy, I-Power Energy Systems, Tawas, Rolls-Royce, Cummins, IPL, Midwest ISO, and Delphi.
- ▣ Collaborative research with national labs has been established.
- ▣ Certificate programs (to be developed).
- ▣ Training programs tailored for specific needs.

Energy Engineering BS Curriculum

▣ Science and Math courses	30 cr.
▣ Engineering Fundamentals (ME and ECE)	44 cr.
▣ Energy Engineering courses	28 cr.
▣ Technical Electives	6 cr.
▣ General Education	21 cr.
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Total	129 cr.

Specialized courses

- ▣ Renewable Energy Systems and Design
- ▣ Electric Power Networks and Interfaces
- ▣ Clean Power Generation
- ▣ Thermal and Hydro Generation
- ▣ Wind and solar Generation
- ▣ Hybrid & Electric Transportation
- ▣ Energy Storage Devices and Systems
- ▣ Fuel Cell & Battery Engineering
- ▣ Nuclear Power Systems
- ▣ Electric Power Systems
- ▣ Power Electronics
- ▣ Industrial Energy Systems Design
- ▣ Power System
- ▣ HEV Modeling and Simulation

Your involvement

- ▣ We encourage the companies to be involved in our programs
 - Advisory board
 - Students
 - Curriculum development
 - Internship or co-op
 - Assessing the programs

Mutual benefit to both IUPUI and Indiana companies

- ▣ Make companies more competitive
- ▣ Attract energy companies to Indiana
- ▣ Promote collaborative research
- ▣ Strengthen the education program